

Kanate Witayangkool 2012: The Study of Design of Load Cell Using Finite Element Method. Master of Engineering (Mechanical Engineering), Major Field: Mechanical Engineering, Department of Mechanical Engineering. Thesis Advisor: Assistant Professor Tumrong Puttapitukporn, Ph.D. 78 pages.

This research is aimed to study the design of beam type load cells installed in digital scales. The stress contours and locations of the maximum stress on load cells containing circular and rectangular slots subjected to loading were studied. The prototype load cell combined rectangular with circular slots was designed and analyzed its strength and also the fatigue life using MSC Patran and MSC Fatigue Version 2005 programs.

The researchers studied the shape variables of slots affected on their stress contour. The maximum stress was found on the top surface and increased as its wide increased. While its length slightly affected on the maximum stress. The prototype load cell has slot $d/W = 0.7$. This load cell can measure the maximum weight of 50 kg with measuring precision of 0.01 kg. It has the safety factor of 3.93 and the fatigue life of 1×10^{20} cycles.

Student's signature

Thesis Advisor's signature